IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of:	)	Examiner: Palabrica, R.J.
AKERS, Douglas, W.	)	Group Art Unit: 3641
Serial No. 09/932,531	)	Confirmation No.: 4276
Filing Date: August 17, 2001	)	
For: APPARATUS FOR PHOTON ACTIVATION POSITRON ANNIHILATION ANALYSIS	)	
Atty Dkt: B-124	)	

RESPONSE TO NOTIFICATION OF NON-COMPLIANT APPEAL BRIEF

On October 27, 2006, the examiner issued a notification of non-compliant appeal brief. The appellant has addressed the issues raised by the examiner in his notification. The changes the examiner requested do not alter the pagination of the appeal brief. Therefore, in accordance with MPEP 1205.03 and to reduce the volume of paper submitted, the appellant is submitting replacement sections for the status of the claims and the summary of claimed subject matter.

The appellant believes that the issues raised in the notification of non-compliant appeal brief have been rectified and that the notification should be withdrawn. If any

issues remain to be resolved, the examiner is requested to contact the applicant's attorney at the telephone number listed below.

Certificate of Electronic Filing

I hereby certify that this correspondence is being submitted to the United States Patent and Trademark Office via electronic filing this 27th day of November, 2006.

Dahl & Chetlin, LLC

By: Cynthia Sullivan
Cynthia Sullivan

Respectfully submitted,
DAHL & CHETLIN, LLC

By: Bruce E Dahl

Bruce E. Dahl
Registration No. 33,670
555 Seventeenth Street, Suite 3405
Denver, CO 80202
Telephone: (303) 291-3200

STATUS OF THE CLAIMS

Claims 20-24, 26-28, and 30-40 are pending in the application. Claims 1-3, 5-19, 25 and 29 have been cancelled; claim 4 has been withdrawn. Appellant agrees with the examiner that claim 8 has been cancelled. Claims 20-24, 26-28, and 30-40 currently stand rejected. The rejections of claims 20-24, 26-28, and 30-40 are appealed.

SUMMARY OF CLAIMED SUBJECT MATTER

The present invention is directed to apparatus for performing non-destructive testing of materials using positron annihilation. The invention as claimed is summarized below with reference to the independent claims and claims separately argued. Claims 20, 26, 31, 34, 36 and 37 are independent claims. Claims 21, 22, 24, 27, 28, 32, 33, 35 and 38 are dependent claims argued separately. The claims contain reference numerals and reference to the specification and drawings. All references are shown in the application at least where indicated herein.

20. Non-destructive testing apparatus (10, Figure 1, ¶¶ 19, 20, and 34-45), comprising:

a photon source (12, Figures 1 and 5, ¶¶ 19, 20, and 34-37), said photon source (12) producing photons (16, Figures 1 and 5, ¶¶ 19, 20, and 34-37) having a predetermined energy and directing the photons (16) toward a specimen (18, Figures 1 and 5, ¶¶ 19-30, 34, 39-46, and 50-60) being tested, the photons (16) from said photon source (12) resulting in the creation of positrons within the specimen (18) being tested;

a detector (14, Figures 1 and 5 ¶¶ 19, 20, and 38-40) positioned adjacent the specimen (18) being tested, said detector (14) producing raw data (22, Figure 1, ¶¶ 19, 24, 27-29, 41, 50, and 55) indicative of a positron annihilation event; and

a data processing system (60, Figures 1 and 6, ¶¶ 27, 30, 41-43 and 55) operatively associated with said detector (14) and said photon source (12), said data processing system (60) operating in accordance with a normal activation/analysis process (38, Figures 2 and 3, ¶¶ 22-24 and 48-50) when a half-life of a selected positron emitter within the specimen (18) being tested is greater than a predetermined half-life, said data processing system (60) operating in accordance with a rapid activation/analysis process (40, Figures 2 and 4, ¶¶ 22, 25, 26, 48, and 51-54) when a half-life of the selected

positron emitter within the specimen (18) being tested is less than the predetermined half-life, said data processing system (60), when operated in accordance with the rapid activation/analysis process (40), alternatively activating said photon source (12) and detecting raw data (22) indicative of a positron annihilation event, said data processing system (60) including a Doppler broadening algorithm (62, Figure 6, ¶¶ 27-30, 55, 56, 58, and 60), said Doppler broadening algorithm (62) processing raw data (22) indicative of a positron annihilation event to produce output data (26, Figure 1, ¶¶ 19, 20, and 41-43) indicative of the presence or absence of a lattice defect in the specimen (18) being tested.

21. The non-destructive testing apparatus (10) of claim 20, wherein said detector (14) produces raw data (22) indicative of a positron formation event, and wherein said data processing system (60) includes a positron lifetime algorithm (64, Figure 6, ¶¶ 27-30, 55, 57, and 60), said positron lifetime algorithm (64) processing raw data (22) indicative of a positron formation event to produce output data (26) indicative of a changing presence or absence of a lattice defect.

22. The non-destructive testing apparatus (10) of claim 20, further comprising a second detector (14', Figure 1, ¶ 40) positioned adjacent the specimen being tested, said second detector (14') producing raw data (22) indicative of a positron formation event, wherein said data processing system (60) includes a positron lifetime algorithm (64, Figure 6, ¶¶ 27-30, 55, 57, and 60), said positron lifetime algorithm (64) processing data indicative of a positron formation event to produce output data (26) indicative of a changing presence or absence of a lattice defect.

24. The non-destructive testing apparatus (10) of claim 20, wherein said data processing system (60) includes a three-dimensional imaging algorithm (66, Figure 6, ¶¶ 27-30, 55, and 58-60), said three-dimensional imaging algorithm (66) processing raw data (22) indicative of a positron annihilation event to produce output data (26) indicative of a location of the presence or absence of a lattice defect within the specimen (18) being tested.

26. Non-destructive testing apparatus (10, Figure 1, ¶¶ 19, 20, and 34-45), comprising:

positron activation means (12, Figures 1 and 5, ¶¶ 19, 20, and 34-37) for activating a positron emitter within a specimen (18, Figures 1 and 5, ¶¶ 19-30, 34, 39-46, and 50-60) being tested;

detector means (14, Figures 1 and 5 ¶¶ 19, 20, and 38-40) for detecting a positron annihilation event within the specimen (18) being tested and for producing raw data (22, Figure 1, ¶¶ 19, 24, 27-29, 41, 50, and 55) indicative of the positron annihilation event;

means for alternately activating (40, Figures 2 and 4, ¶¶ 22, 25, 26, 48, and 51-54) the positron emitter within the specimen (18) being tested and detecting a positron annihilation event; and

data processing means (60, Figures 1 and 6, ¶¶ 27, 30, 41-43 and 55) operatively associated with said detector means (14), said data processing means (60) processing raw data (22) indicative of the positron annihilation event in accordance with a Doppler broadening algorithm (62, Figure 6, ¶¶ 27-30, 55, 56, 58, and 60) to produce output data (26, Figure 1, ¶¶ 19, 20, and 41-43) indicative of the presence or absence of a lattice defect in the specimen (18) being tested.

27. The non-destructive testing apparatus (10) of claim 26, wherein said detector means (14) detects a positron formation event and a positron annihilation event and produces raw data (22) indicative of the positron formation event and the positron annihilation event, and wherein said data processing means (60) processes raw data (22) indicative of the positron formation event in accordance with a positron lifetime algorithm (64) to produce output data (26) indicative of a changing presence or absence of a lattice defect.

28. The non-destructive testing apparatus (10) of claim 26, further comprising second detector means (14', Figure 1, ¶40) for detecting a positron formation event and for producing raw data (22) indicative of the positron formation event, wherein said data processing means (60) processes raw data (22) indicative of the positron formation event in accordance with a positron lifetime algorithm (64) to produce output data (26) indicative of a changing presence or absence of a lattice defect.

31. Non-destructive testing apparatus (10, Figure 1, ¶¶ 19, 20, and 34-45), comprising:

a photon source (12, Figures 1 and 5, ¶¶ 19, 20, and 34-37), said photon source (12) producing photons (16, Figures 1 and 5, ¶¶ 19, 20, and 34-37) having a predetermined energy and directing the photons (16) toward a specimen (18, Figures 1 and 5, ¶¶ 19-30, 34, 39-46, and 50-60) being tested, the photons (16) from said photon source (12) resulting in the creation of positrons within the specimen (18) being tested;

a detector (14, Figures 1 and 5 ¶¶ 19, 20, and 38-40) positioned adjacent the specimen (18) being tested, said detector (14) producing raw data (22, Figure 1, ¶¶ 19, 24, 27-29, 41, 50, and 55) related to a positron annihilation event; and

a Doppler broadening processor (62, Figure 6, ¶¶ 27-30, 55, 56, 58, and 60)

operatively associated with said detector (14) and responsive to the raw data (22) produced thereby, said Doppler broadening processor (62) producing output data (26, Figure 1, ¶¶ 19, 20, and 41-43) indicative of the presence or absence of a lattice defect in the specimen (18) being tested.

32. The non-destructive testing apparatus (10) of claim 31, further comprising three-dimensional imaging apparatus (66, Figure 6, ¶¶ 27-30, 55, and 58-60) operatively associated with said detector (14) and responsive to the raw data (22) produced thereby, said three-dimensional imaging apparatus (66) producing output data (26) indicative of a location of the presence or absence of a lattice defect within the specimen (18) being tested.

33. The non-destructive testing apparatus (10) of claim 31, wherein said detector (14) produces raw data (22) that include data indicative of a positron formation event and data indicative of a positron annihilation event, said non-destructive testing apparatus (10) further comprising a positron lifetime processor (64, Figure 6, ¶¶ 27-30, 55, 57, and 60) operatively associated with said detector (140 and responsive to the raw data (22) produced thereby, said positron lifetime processor (64) producing output data (26) indicative of the presence or absence of a lattice defect of the specimen (18) being tested and indicative of a changing presence or absence of a lattice defect.

34. Non-destructive testing apparatus (10, Figure 1, ¶¶ 19, 20, and 34-45), comprising:

a photon source (12, Figures 1 and 5, ¶¶ 19, 20, and 34-37), said photon source (12) producing photons (16, Figures 1 and 5, ¶¶ 19, 20, and 34-37) having a predetermined energy and directing the photons (16) toward a specimen (18, Figures 1 and

5, ¶¶ 19-30, 34, 39-46, and 50-60) being tested, the photons (16) from said photon source (12) resulting in the creation of positrons within the specimen (18) being tested;

a detector (14, Figures 1 and 5 ¶¶ 19, 20, and 38-40) positioned adjacent the specimen (18) being tested, said detector (14) producing raw data (22, Figure 1, ¶¶ 19, 24, 27-29, 41, 50, and 55) indicative of a positron formation event and a positron annihilation event; and

a positron lifetime processor (64, Figure 6, ¶¶ 27-30, 55, 57, and 60) operatively associated with said detector (14) and responsive to the raw data (22) produced thereby, said positron lifetime processor (64) producing output data (26, Figure 1, ¶¶ 19, 20, and 41-43) indicative of a the presence or absence of a lattice defect in the specimen (18) being tested and indicative of a changing presence or absence of a lattice defect.

35. The non-destructive testing apparatus (10) of claim 34, further comprising three-dimensional imaging apparatus (66, Figure 6, ¶¶ 27-30, 55, and 58-60) operatively associated with said detector (14) and responsive to the raw data (22) produced thereby, said three-dimensional imaging apparatus (66) producing output data (26) indicative of a location of the presence or absence of a lattice defect within the specimen (18) being tested.

36. Non-destructive testing apparatus (10, Figure 1, ¶¶ 19, 20, and 34-45), comprising:

a photon source (12, Figures 1 and 5, ¶¶ 19, 20, and 34-37), said photon source (12) producing photons (16, Figures 1 and 5, ¶¶ 19, 20, and 34-37) having a predetermined energy and directing the photons (16) toward a specimen (18, Figures 1 and 5, ¶¶ 19-30, 34, 39-46, and 50-60) being tested, the photons (16) from said photon source (12) resulting in the creation of positrons within the specimen (18) being tested;

a detector (14, Figures 1 and 5 ¶¶ 19, 20, and 38-40) positioned adjacent the specimen (18) being tested, said detector (14) producing raw data (22, Figure 1, ¶¶ 19, 24, 27-29, 41, 50, and 55) indicative of a positron formation event and a positron annihilation event; and

a data processing system (60, Figures 1 and 6, ¶¶ 27, 30, 41-43 and 55) operatively associated with said detector (14), said data processing system (60) including:

a Doppler broadening algorithm (62, Figure 6, ¶¶ 27-30, 55, 56, 58, and 60), said Doppler broadening algorithm (62) processing raw data (22) indicative of a positron annihilation event to produce output data (26, Figure 1, ¶¶ 19, 20, and 41-43) indicative of a presence or absence of a lattice defect in the specimen (18) being tested;

a positron lifetime algorithm (64, Figure 6, ¶¶ 27-30, 55, 57, and 60), said positron lifetime algorithm (64) processing raw data (22) indicative of a positron formation event to produce output data (26, Figure 1, ¶¶ 19, 20, and 41-43) indicative of a changing presence or absence of a lattice defect; and

a three-dimensional imaging algorithm (66, Figure 6, ¶¶ 27-30, 55, and 58-60), said three-dimensional imaging algorithm (66) processing raw data (22) indicative of a positron annihilation event to produce output data (26, Figure 1, ¶¶ 19, 20, and 41-43) indicative of a location of the presence or absence of a lattice defect within the specimen (18) being tested.

37. Non-destructive testing apparatus (10, Figure 1, ¶¶ 19, 20, and 34-45), comprising:

a photon source (12, Figures 1 and 5, ¶¶ 19, 20, and 34-37), said photon source (12) producing photons (16, Figures 1 and 5, ¶¶ 19, 20, and 34-37) having a

predetermined energy and directing the photons (16) toward a specimen (18, Figures 1 and 5, ¶¶ 19-30, 34, 39-46, and 50-60) being tested, the photons (16) from said photon source (12) resulting in the creation of positrons within the specimen (18) being tested;

a detector (14, Figures 1 and 5 ¶¶ 19, 20, and 38-40) positioned adjacent the specimen (18) being tested, said detector (14) producing raw data (22, Figure 1, ¶¶ 19, 24, 27-29, 41, 50, and 55) indicative of a positron annihilation event; and

a data processing system (60, Figures 1 and 6, ¶¶ 27, 30, 41-43 and 55) operatively associated with said detector (14) and said photon source (12), said data processing system (60) including:

a Doppler broadening algorithm (62, Figure 6, ¶¶ 27-30, 55, 56, 58, and 60), said Doppler broadening algorithm (62) processing raw data (22) indicative of a positron annihilation event to produce output data (26, Figure 1, ¶¶ 19, 20, and 41-43) indicative of a presence or absence of a lattice defect in the specimen (18) being tested; and

a positron lifetime algorithm (64, Figure 6, ¶¶ 27-30, 55, 57, and 60), said positron lifetime algorithm (64) processing raw data (22) indicative of a positron formation event to produce output data (26) indicative of a changing presence or absence of a lattice defect,

said data processing system (60) operating in accordance with a normal activation/analysis process (38, Figures 2 and 3, ¶¶22-24 and 48-50) when a half-life of a selected positron emitter within the specimen (18) being tested is greater than a predetermined half-life, said data processing system (60) operating in accordance with a rapid activation/analysis process (40, Figures 2 and 4, ¶¶22, 25, 26, 48, and 51-54) when a half-life of the selected positron emitter within the

specimen (18) being tested is less than the predetermined half-life, said data processing system (60), when operated in accordance with the rapid activation/analysis process (40), alternatively activating said photon source (12) and detecting raw data (22) indicative of a positron annihilation event, said data processing system (60) using said Doppler broadening algorithm (62) and said positron lifetime algorithm (64) to process raw data (22) indicative of a positron annihilation event and produce output data (26) indicative of the presence or absence of a lattice defect in the specimen (18) being tested.

38. The non-destructive testing apparatus (10) of claim 37, wherein said data processing system (60) further comprises a three-dimensional imaging algorithm (66, Figure 6, ¶¶ 27-30, 55, and 58-60) and wherein said data processing system (60) uses said three-dimensional imaging algorithm (66) to produce output data (26) indicative of a location of the presence or absence of a lattice defect within the specimen (18) being tested.